

### 3.0 SOIL BORING PROGRAM

#### 3.1 SOIL BORING LOCATIONS

As specified in Section 1.2 Purpose and Scope, the purpose of the soil borings is to characterize, geologically and chemically, the cover and subsurface materials within and/or downgradient of the Ash Pits, Incinerator, and Concrete Wash Pad areas and to characterize the contamination sources at IHSS 133. The soil borings will also assist in assessing the lateral and vertical extent of the ashpits.

Currently, the soil boring program is expected to encompass the areas occupied by the Ash Pits, Incinerator, Concrete Wash Pad, disturbed areas and a section of the hillside south of IHSS 133.6 and north of Woman Creek (as determined by the aerial photographs and the 1992 HPGe gamma radiation survey). The soil boring program includes a total of 28 borings. Eighteen borings will be placed on 50- to 100-foot centers along the long axes of IHSSs 133.2 through 133.4 and associated covered trenches or pits (Figure 8). Two borings will be placed in IHSS 133.5 in the approximate area of the incinerator pad. One boring will be placed in IHSS 133.1 to confirm the validity of the geophysical survey (is an Ash Pit present or not at this location). Three borings will be placed downgradient of IHSS 133.6 on 100-foot centers. Borings will not be placed within IHSS 133.6 since this IHSS is a steep slope consisting of presumably thick concrete. Additional areas to be investigated are discussed below.

Due to the narrow geometry of the pits (approximately 15 feet wide) and the scant amount of information available on the quantities and types of incinerator related materials which were placed in these pits (IHSSs 133.2 through 133.4) locating boreholes within the pits, as presented on Figure 8, may be difficult. Should a combination of information presented in Section 2.0 and site walk overs prove inconclusive in assessing pit locations an exploratory borehole program will be initiated.

The exploratory borehole program would consist of placing a borehole at the proposed center borehole location for each pit whose location is deemed to be suspect (Figure 8). This borehole would be advanced to a total depth of 10 feet with drive samples being collected at depths of 5 and 10 feet. These samples and associated drill cuttings would then be used only for the assessment of the existence of incinerator related materials. Should the drive samples or drill cuttings indicate that a pit had been intercepted, a borehole would be advanced and sampled adjacent to the exploratory borehole using the methods presented below. However, should the samples and cuttings derived from the exploratory borehole provide no evidence of incinerator related materials a second exploratory borehole would be located 10 feet away from the first exploratory borehole in a direction perpendicular to the long axis of the pit. Should the drive samples or drill cuttings from the second exploratory borehole indicate that a pit had been intercepted, a borehole would be advanced and sampled adjacent to the exploratory borehole using the methods presented below. Finally, should the samples and cuttings derived from the second exploratory borehole provide no evidence of incinerator related materials a third exploratory borehole would be located 10 feet away from the first exploratory borehole in a direction perpendicular to the long axis of the pit and opposite of the second exploratory borehole. Should the drive samples or drill cuttings from the third exploratory borehole indicate that a pit had been intercepted, a borehole would be advanced and sampled adjacent to the exploratory borehole using the methods presented below.

Based on the results of the exploratory borehole program the alignment of the remaining two boreholes per pit, as presented on Figure 8, would be adjusted to conform with a revised pit alignment. Should the exploratory borehole program fail to yield confirmation of incinerator related materials the borehole

program as presented on Figure 8 would be retained for all boreholes at each pit location, for a maximum of three exploratory boreholes and three standard boreholes per pit.

The Historical Release Report (HRR) (U.S. DOE, 1992b) suggests that the areas southeast and southwest of the incinerator may have been used for disposal of ashes; therefore one boring is proposed for each of these areas (Figure 8). The OU5 RFI/RI Work Plan states that ashes may have been pushed over the hillside into the Woman Creek drainage, but it is not specific as to the location of this activity. Since Woman Creek runs fairly close to IHSS 133.6, and this area is just south of the Incinerator, the three borings on 100-foot centers proposed to investigate IHSS 133.6 will also serve to investigate the area, described in the Work Plan, between these IHSSs and Woman Creek (Figure 8). An additional disturbed area was identified in the aerial photograph review (Figure 2). Two borings are proposed for investigation of the "pit and disturbed area" east of the Ash Pits.

As specified in the OU5 Work Plan, soil borings will also be placed in the central location of any anomalous areas detected by the HPGe survey. As stated in Section 2.3, the HPGe survey of the IHSS 133 series has not been fully evaluated, additional borings may be proposed to investigate any anomalies detected.

A brief site visit indicated the terrain to be rough and steep in places. Such features may make access to soil boring sites difficult. Therefore, the proposed soil boring locations may be adjusted to accommodate for field conditions.

The borings that are to be installed for the investigation of IHSSs 133.1 - 133.6 will be drilled 6 feet into weathered bedrock. If the bedrock encountered during drilling is a sandstone, the borings will be advanced 6 feet into the next claystone horizon. Since sandstone units are potential pathways for contaminant transport, it is important to assess the extent and thickness of these units. The thickness of the colluvium and Rocky Flats Alluvium (geologic formations that overlie the bedrock) in this area is unknown since the three closest monitoring wells (1474, 5686, and B402689) have been drilled within the Woman Creek drainage itself and thus encountered somewhat different geologic conditions (U.S. DOE, 1992a). The colluvium and Rocky Flats Alluvium have been estimated to be approximately 20 feet thick based on the isopach map of the colluvium and alluvium provided in the Work Plan for the Original Landfill (IHSS 115). IHSS 115 lies approximately 500 feet to the east of the Ash Pits and is on a similar slope and aspect. Based on the above information, it is estimated that the total depth of these borings will be approximately 25 feet.

Figure 8 shows the proposed soil boring locations. The drilling and soil sampling techniques that will be implemented during this drilling program are described in detail in the following sections.

After borehole locations have been cleared and obstructions removed, an exclusion zone will be established according to the Site-Specific Health and Safety Plan, and the drill rig will be set up. The boring will be advanced to the depth indicated and sampled according to section 3.3.

The borings will be logged lithologically by examination and geologic classification of the samples. Documentation will be completed by the site geologist according to Section 8.0 of SOP GT.2, Drilling and Sampling Using Hollow-Stem Auger Techniques (EG&G, 1992b). SOP GT.1, Logging Alluvial and Bedrock Material (EG&G, 1992a), describes procedures for material classification and borehole logging.

During the drilling and while the augers are being removed, the cuttings and unsaved portions of samples from the boring will be containerized according to SOP FO.8, Handling of Drilling Fluids and Cuttings (EG&G, 1992h), and SOP FO.9, Handling of Residual Samples (EG&G, 1992i). The cuttings and unsaved portions of samples derived as a result of the exploratory borehole program, outlined in Section 3.1, will be chemically characterized by using the adjacent, fully sampled, borehole information.

#### 3.2.1 Boring Completion And Abandonment

After the borehole has been advanced to its final depth, it will be abandoned according to SOP GT.5, Plugging and Abandonment of Boreholes (EG&G, 1992j).

The boring location stake will be left in the ground adjacent to the borehole, and a board or other cover placed over the hole until it has been grouted. All boreholes to be abandoned with a depth greater than one foot will be grouted the same day that abandonment is completed. The boring location stake will then be placed in the grout. If any borings are less than one-foot deep, they will be abandoned by simply backfilling the hole with the native soil.